What is claimed is:

1. A rotor for a synchronous motor comprising a plurality of poles, at least a part of an outer periphery of one pole of the rotor in a cross section perpendicular to a central axis of the rotor being defined by a curve of a hyperbolic function.

2. A rotor for a synchronous motor according to claim 1, wherein the most part of the outer periphery of the one pole of the rotor is defined by the curve of the hyperbolic function.

3. A rotor for a synchronous motor according to claim 1, wherein the whole part of the outer periphery of the one pole of the rotor is defined by the curve of the hyperbolic function.

4. A rotor for a synchronous motor according to claim 1, wherein a central part of the outer periphery of the one pole is defined by the curve of the hyperbolic function.

5. A rotor for a synchronous motor according to claim 1, wherein said hyperbolic function is expressed as $R = A - B \cdot (e^{C\theta} + e^{-C\theta})$, where R represents a distance from a central axis of the rotor or a fixed point, θ represents a rotational angle from a straight line passing through a center of the outer periphery of one pole and perpendicular to the central axis of the rotor, A, B and C are constants and e is a base of natural logarithm or a constant.

6. A rotor for a synchronous motor according to claim 1, wherein said hyperbolic function is expressed as $X = A - B(e^{CY} + e^{-CY})$ on a X–Y coordinate system with a X axis passing through a center of the outer periphery of one pole of the rotor and perpendicular to a central axis of the rotor, a Y axis perpendicular to the X axis and the central axis of the rotor and an origin as a crossing point of the X axis and the Y axis, where A, B and C are constants and e is a base of natural logarithm or a constant.

7. A rotor for a synchronous motor according to any one of claims 1 through 6, wherein the outer periphery of one pole of the rotor includes a region defined based on a train of points on said curve of the hyperbolic function and a line connecting the train of points by segments of straight lines or curves.